A STUDY OF THE AVIFAUNA OF THE LAKE ERIE ISLANDS.

(With Particular Reference to the Migration Phenomena.)

BY LYNDS JONES.

(Continued from page 18.)

The summer study on Pelee Island in 1910 began on July 16, when two men, accompanied by their wives, landed at the camping ground on Fishing Point among the red cedars. Except for one visit of a night and a day to oversee the work on the part of the writer, these two men continued the work without other assistance for two weeks, at the end of which time the remainder of the company reached the island. The entire company was composed of nine men and two women and the teacher. The two men and their wives left on August 26, and on September 2 one of the remaining men was taken to a hospital in Sandusky. On this same day two other men came to our camp and remained with us until our final departure on the 7th of September. While these two men were visitors they assisted in the work. It will be seen that the work began early enough to make a thorough study of the avian conditions of the island before the migrations began, thus affording interesting studies of the ecological conditions of the summer resident birds, and furnishing means of comparison between the summer status and the conditions during the migrations.

It must be understood that there was no such intensive study of the island as a whole as was made of the Fishing Point and its immediate environs, but enough study of the whole island was made to give a fair idea of the conditions as far as the bird life is concerned.

Quite contrary to what we had been led to suppose, Pelee Island is by no means one big marsh bordered by a lake beach all around. Nearly the whole southern fifth of the island is high ground underlaid by lime rock, presumably of the Niagara formation. A somewhat

rounded area one mile in width by nearly a mile and a half in length of similar high ground underlaid by stone occupies the eastern side, a little north of the middle, and an area of about half the dimensions occupies the middle and base of the north-eastern point, while a larger area forms the north-western point, extending also to the middle of the North Bay, and down the west shore nearly two miles. The interior, which is more than half surrounded by these high limestone areas, was once a marsh, but all of it has been drained out and is cropped every summer. The staple crop is tobacco — the same kind that is raised in Kentucky. Corn, oats, wheat, and potatoes are also grown. The only swamps upon the island now are a somewhat extensive one which occupies the north end of Light House Point. This covers an area rather less than 500 acres. There is a smaller marsh bordering the middle of South Bay, and one of perhaps thirty acres on the east side of the base of Fishing Point. There is also a very small muck swamp, of much less than an acre, on the west side of Mosquito Point. Thus the conditions which prevail on this island are now quite dissimilar from those on Point Pelee as reported by Taverner and Swales.*

Of course Fishing Point runs out into the lake much as the extreme point of Point Pelee does, and conditions here are the same. It might be said, however, that conditions on Fishing Point are much nearer primitive than is the southern end of Point Pelee. Fishing Point contains no dwellings, and the single narrow road is almost no disturbance to the forest. We were told that in the earlier days the island was densely wooded with red cedars. There is still evidence that the higher areas were covered by deciduous forests.

That Fishing Point is gradually being shifted west there is abundant evidence in the cutting away of the east beach and the building up of the west beach, as well as the submerged roots and stumps of huge trees now rods from the east beach. Every year witnesses the overthrow of trees, some of them of more than a foot in diameter, on the east

* Wilson Bulletin 19, p. 39 *et seq.*

side of the Point, and the self-planting of trees on the west side. The series of parallel ridges are parallel to the west side, but not to the east side.

A summary of the work done follows in the language of two of the students, supplemented later by a list of the birds and their dates of occurrence. These reports undertake to give a brief survey of the more prominent ecological features that have some bearing upon the distribution of the birds.

Report on the Ecology of Pelee Island, Summer of 1910.

Part I.

Bird conditions before the beginning of migrations.

Before the beginning of the migrations the birds were divided into four distinct groups ecologically; one of which has several further subdivisions. These are the birds found in the woods on the point, the marsh birds, the water and beach birds, and the birds found inland, mostly about cultivated fields or small woodlots.

Under the first group, that of the woods birds, there are three subdivisions, the birds of the cedars, the birds of the deciduous belt, and the birds that frequented both indiscriminately.

The birds found distinctively among cedars were the Screech Owl, Cardinal, Cedar Waxwing, Pine Warbler, and Brown Thrasher. Of these Cardinal, Cedar Waxwing, and Thrasher deserve especial mention because of their great abundance, especially considering the northern locality. The Pine Warbler must have nested there, which is a good record. The Screech Owl was probably seen only in the cedars because we were there most after dark.

Of the birds seen only in the deciduous belt, the Hairy, Downy and Red-headed Woodpeckers stayed among the tall trees with dead tops, found at the base of the point. The Blue Jay, Warbling Vireo and Crested Flycatcher, as well as the Black-billed Cuckoo, also stayed in these tall trees, among the dense foliage. The Towhee and Catbird stayed in the

dense thickets south and west of the marsh, while the Woodcock frequented the damp woods west of the marsh. The Wood Pewee, Northern Yellow-throat and Redstart stayed mostly in the lower deciduous trees on the point itself.

The Mourning Dove, Yellow-billed Cuckoo, Flicker and Crow were found indiscriminately in the woods and in about their usual numbers. The Robin, Bronzed Grackle, Song Sparrow and Baltimore Oriole were present indiscriminately, but in smaller numbers than is usual on the Ohio shore. The Carolina Wren was also present in small numbers, which is unusual for so northern a locality. The Kingbird, Orchard Oriole, Indigo Bunting and Red-eyed Vireo were present in unusual abundance, especially the two last mentioned.

The Marsh birds, which had presumably bred in the swamp on the island, were the Wood Duck and Blue-winged Teal, the Least and American Bitterns, the Green and Great Blue Herons, the King, Virginia and Sora Rails, the Florida Gallinule, the Short-eared Owl, Belted Kingfisher, Phoebe, Alder Flycatcher, Red-wing, and Long-billed Marsh Wren. Yellow Warblers and Louisiana Water-Thrushes may also have nested here. The Black Terns nest in swamps, but at the time of our visit were plainly beach birds. They probably do not nest on the island.

The birds found flying over the water and lighting on the beach were the Herring Gull, Common and Black Terns, Spotted Sandpiper, and Killdeer. The Belted Kingfisher divided his time about equally between the beach and the swamp. Some Common Terns were still nesting on Middle Island and the Hen and Chicken group, but most of the gulls and terns were through nesting, and gathered on the end of the sandspit in immense numbers, standing there much of the day. The Black Terns were in the curious mottled, molting plumage very largely.

In the pastures and cultivated fields inland were some species, such as the Bobolink, Meadowlark, Vesper and Field Sparrows and Migrant Shrike, which never came upon the point. Around the houses and orchards were a few House

Wrens and Bluebirds, although they were much less common than in Ohio. In the bits of woodland and in great trees left in the open fields were the nests of Bald Eagles, and Red-shouldered and Red-tailed Hawks, and Great Horned Owls were also found in the woods.

Part II.

MIGRATION CONDITIONS.

During the migrations there were four, or possibly five, different groups. Some worked south by stages, resting at night in the swamps, others followed the beach, or flew out over the water, some flew right out the point from base to tip, either continuing their flight all the way, or lighting in the trees occasionally to rest; but by far the greatest number of birds worked along gradually through the woods, only starting in their flight when they reached the limit of shrubby vegetation. These are the birds that cannot often be seen in the act of migrating, and which Pelee Island is especially suited to catch in the act.

The Swamp-frequenting migrants were the Pied-billed Grebe, Mallard, Coot and Black Duck, where there was open water; the Wilson's Snipe, Yellow-legs, and Solitary Sandpiper on the mudflats. The Least, Semipalmated, Baird's and Spotted Sandpiper and the Killdeer and Semipalmated Plovers occasionally visited the mudflats, although usually staying on the beach. The Little Blue Heron, a straggler from the south, may as well be mentioned here. Its occurrence so far north is rare, but not unprecedented. The Rails and Herons were probably migrating, but we could not detect their movement with certainty.

Over the water migrated the Bonaparte Gull and Caspian Tern, and along the beach came a host of shore-birds. The Dowitcher, Knot, Baird Sandpiper, Hudsonian Godwit, and Black-bellied Plover were some rarities that were seen; the Baird Sandpiper in considerable numbers. The Least, Semipalmated, and Spotted Sandpiper, the Sanderling, the Ruddy Turnstone, and the Piping, Semipalmated and Killdeer Plo-

vers were all seen in unusual numbers. Only the Pectoral and Red-backed Sandpipers were seen more rarely than might have been expected.

Of the birds that flew over the trees, the Swallows and Blackbirds were easily the most noticeable, the former flying in loose aggregations, the latter in compact flocks. The Swallow bands were usually composed of all the species, but with a decided predominance of one or two kinds. At first the commonest were the Rough-winged, but soon the Bank also became prominent, only to be outnumbered in turn by the Purple Martin. The Barn Swallows were always present in good numbers, but the Tree and Cliff Swallows, while usually present, were never seen in large numbers. The Swallows migrated mostly before 9:00 a. m. and after 5:00 p. m., but on favorable days a steady stream would be passing from morning until night. Of the Blackbirds, the Bobolinks came past in flocks of Bobolinks alone, ranging in number from twenty-five to three or four hundred. Red-wings, Bronzed Grackles and Cowbirds came in flocks mostly of one species, but containing also some individuals of the other two. Blackbirds (including Bobolinks) were only seen passing in the morning and at night, not in the middle of the day. Once an enormous flock of Grackles was found scattered and feeding around the west end of the swamp. The passing Redwings also often paused at the swamp. After passing the base of the point, however, they did not usually light again.

The Swallows were usually accompanied by a few Chimney Swifts; and Nighthawks, Ospreys and Marsh Hawks were also seen migrating, flying usually high in the air. The Marsh Hawks seemed to migrate usually in pairs.

The Goldfinch, Rose-breasted Grosbeak and Bluebird migrated singly or in small companies, and lit, here and there, in the trees to rest. They act much like the Bluebirds, but light more. The Mourning Dove, Flicker, Red-headed Woodpecker, and Kingbird traveled in small, loose, companies, which in the case of the last mentioned, almost reach the dignity of flocks sometimes. They light even more than the

Goldfinches and Bluebirds, almost always stopping to rest and discuss the matter before starting out for the crossing to Middle Island. The Sharp-shinned Hawk and Goshawk hang on the skirts of the great warbler and thrush flocks, taking their toll of victims, and necessarily lighting to devour them. The Ruby-throated Hummingbird does not really light, but is mentioned here because of its habit of stopping to hover in front of a primrose blossom before speeding on close to the sand and off over the water.

Of the birds that worked out through the woods there are three groups, the flycatchers, the thrushes, and the warblers. The Purple Finch, House Wren, Blue-gray Gnatcatcher and Red-breasted Nuthatch also came down the point in this way. The Red-breasted Nuthatches and Blue-gray Gnatcatchers seemed to prefer the cedars to the deciduous trees. The Thrushes were satisfied with anything that kept them well concealed and out of sight. The Flycatchers had no choice, as far as I could see. The little red dragonflies (Sympetrum rubicundulum) that formed a large part of their food, were equally numerous everywhere. Early in the season, the warblers seemed to prefer the red oaks, usually surrounded by cedars, but later they were perhaps crowded out into the cedars, for they often left the oaks empty, while the cedars near by were full. In the great jams, the cedars and oaks alike were packed with birds. The warblers seemed to eat mostly small spiders and beetles, which they gleaned from the branches.

Of the flycatchers, the Olive-sided kept mostly to certain favorite tall, dead tree-tops, just south of the swamp. Occasionally we could get a look at one with the shining flank feathers over the wing, making a most striking field-mark. The Least, Acadian, and Yellow-bellied Flycatchers were all exceedingly numerous, especially the first. They were found everywhere, throughout both cedar and deciduous belts.

The Wood, Wilson, and Olive-backed Thrushes arrived just as we were about to leave. They kept so closely to the underbrush a satisfactory identification was extremely difficult.

The fall warblers were present in almost unbelievable numbers. The Golden-winged, Cape May, Pine, Palm, Prairie, and Connecticut Warblers and the Water-Thrush were species, usually rare, that were seen there in numbers, the Cape May and Water-Thrush being exceedingly abundant on some days. The commonest of the warblers were the Cape May, Black and White, Magnolia, Bay-breasted, Blackburnian, Black-throated Green, and Redstart. All these were exceedingly abundant at some time. On the big warbler days, all of the species just mentioned, together with the Water-Thrush, Louisiana Water-Thrush, Nashville, Tennessee, Black-throated Blue, Cerulean, Chestnut-sided, Black-poll, and Canadian deserved a better mark than "common." The Blue-winged, Golden-winged, Pine, Palm, Prairie, Connecticut, Mourning, Wilson, and Oven-bird were seen time after time. Almost every day these warblers were all present except the extreme rarities, and almost all of them were seen in every plumage, from the full adult to the most disguised youngster. It was a chance to study fall warblers that none of us will ever see the like of again, and we certainly improved it.

In all, 138 kinds of birds were seen on the island. Of these, 85 breed in the latitude, and may be considered as summer residents, 51 are clearly migrants and 2, the Little Blue Heron and Goshawk, are stragglers.

Part III.

MAMMALS OF THE ISLAND.

The only mammals seen were the cotton-tail rabbit, the black and fox squirrels, and the deer or white-footed mouse. It is peculiar that no grey squirrels were seen. Mr. Ackley reported seeing one, however, and perhaps it was due to our lack of observation. The black squirrels were very large and fine specimens. One fox squirrel was found far out on the point, where there was nothing but small shrubs, and killed with a stick. Its presence there was probably due to sympa-

thetic migration. There were signs of muskrats, but the animals themselves were not seen.

Part IV.

REPTILES AND AMPHIBIANS.

Blandings Turtle was the only turtle found in the marsh on the point. Snapping turtles and Margined Turtles (Chrysemys marginata) were found in the canals on the island.

The American Toad and Pickerin's Tree-frog were fairly numerous away from the water, and in the swamp were the Leopard Frog and Bullfrog.

In the lake, swimming around, and occasionally ashore, were found both the common Watersnake (Natrix fasciata sipedon) and the Red-bellied Watersnake (Natrix fasciata erythrogaster). Along the shore and among the cedars were found the Puffing Adder (Heterodon platyrhinus), the Milk Snake (Osceola doliata triangula) and the Garter Snake (Eutania sirtalis sirtalis). Toward the base of the point was found a Black Snake (Bascanion constrictor). In the heavy deciduous timber, climbing the trees, were found several Pilot Snakes (Coluber obsoletus obsoletus). One was brought to my attention by a troop of about fifty warblers, which had gathered about one in a tree about sixty feet high. One of these was the largest snake we killed, measuring five feet and three inches in length.

Part V.

LEPIDOPTERA—BUTTERFLIES.

Anosia plexippus. Monarch.—Common everywhere. Seen migrating and resting in large flocks.

Papilio cresphontes. Giant Swallowtail.—Common among the trees on the point. Seen migrating with A. plexippus.

Papilio asterias. Eastern Swallowtail.—Common.

Papilio turnus. Yellow Swallowtail.—Fairly common on point.

Papilio troilus. Spice-bush Swallowtail.—Common. Seen migrating with A. plexippus.

Pieris rapae. Cabbage Butterfly.—Common. Seen migrating

Colias philodice. Clouded Sulphur.—Common inland. Seen migrating.

Grapa interrogationis. Question sign. — Common, especially at the kitchen garbage hole.

Grapta comma. Comma. — Common, especially at the kitchen garbage hole.

Pyrameis atlanta. Red Admiral.—Fairly common. Migrated in small flocks by itself.

Vanessa antiopa. Mourning-cloak.—Fairly common around camp.

Argynnis aphrodite. Aphrodite Fritillary. Common on Milkweed and Loosestrife flowers, around the swamp.

Brenthis bellona. Meadow Fritillary.—Fairly common inland.

Phyciodes tharos. Pearl-spot.—Common everywhere.

Lycaena sp. Little Blue.—Common in places inland.

FRANCIS M. ROOT.

Fishing Point of Pelee Island proved to be an excellent place for fall bird study. Within a range of three miles there were suitable feeding grounds for all kinds of birds — sandy beaches, rocky ledges, open water, heavy woods, both deciduous and coniferous, open fields, bushy pasturelands and swamps with heavy undergrowth, cat-tails, mud flats and open water.

The summer birds offered no especial peculiarities. The absence or at least rarity of the Wood Thrush, Warbling Vireo, Oven-bird, White-breasted Nuthatch, and Chickadee was noticeable. Cardinals were common, although it was the northern extremity of their range. Eagles seemed to thrive on the island despite the fact that they were shot with impunity. At least ten individuals were seen.

The migrations brought many rarities, especially in the line

of shore birds. The records for the Dowitcher, Knot, Baird Sandpiper, Hudsonian Godwit, Black-bellied Plover, Caspian Tern, Piping Plover, and Little Blue Heron show that the water and shore birds of Lake Erie have not yet been exhaustively studied. Among other unusual records were the Olive-sided Flycatcher, Goshawk, Golden-winged Warbler, Connecticut Warbler, and Blue-winged Warbler. The Cape May Warblers were almost abundant and were common about Oberlin on the 17th of September.

There were three big migratory waves. The first occurred on August 12, and consisted almost wholly of Swallows. About 8000 passed over.

The second wave was on August 27. Besides bringing many swallows and bobolinks, the first batch of warblers arrived. The Redstarts were predominant. The warblers stayed almost entirely in the deciduous trees at the base of the spit.

The third and biggest migration reached its height on September 1, and lasted through the third. On the morning of the first all living beings seemed unduly excited. Butterflies, squirrels, and rabbits, as well as all kinds of birds, worked down towards the end of the spit. Almost no birds were to be seen around the swamp. The movement continued through the next two days, but on the fifth almost everything had left. During this movement the following migrating birds were common: Bobolink, Purple Martin, Least Flycatcher, Red-headed Woodpecker, Black and White Warbler, Blackburnian Warbler, Bay-breasted Warbler, Wilson Warbler, Red-breasted Nuthatch, Chestnut-sided Warbler, Black-poll Warbler, Magnolia Warbler, Wilson Thrush, Olive-backed Thrush, Cape May Warbler, Black-throated Green Warbler, Black-throated Blue Warbler, Oven-bird, Water-Thrush, Louisiana Water-Thrush, and Nighthawk.

The food of the birds while on the spit was not accurately determined. The sandpipers and plovers ate lakeflies and their skins, washed up on the beaches. The redstarts were eating common flies most of the time, while in the cedars all

the warblers lived on insects. They did not touch the cedar nor dogwood berries, but did eat grapes at times.

The warblers always kept on the side of the point most protected from the wind. In those localities where there was an abundance of both cedars and deciduous trees the warblers seemed to shift back and forth between the oaks and the cedars indiscriminately. The red and chestnut oaks were by far the most popular of the deciduous trees, although the sycamores and sugar maples were favored. Warblers could almost always be found in the willows and button-bushes about the swamp. They were rarely found in ash trees.

The vegetation of the point was very peculiar. It had the general southern aspect of all Lake Erie sandspits, but was lacking in those prime features, the cottonwoods and willows. Among the plants which we do not find commonly about Oberlin were the hackberry, chestnut oak, arrow-wood, snowberry, sweet-scented sumach, wafer ash, red cedar, common juniper, western prickly pear, red ash, blue ash, green ash, and red bearberry. The absence of the chestnut, beech, hornbeam, horse chestnut, and smooth sumach were noticeable.

WOODY PLANTS ON FISHING POINT.

Red Maple.—Common at extreme base.
White Maple.—Common at extreme base.
Sugar Maple.—Abundant in the deciduous belt.
Hackberry.—Common in the deciduous belt.
White Ash.—Fairly common, except among the cedars.
Black Ash.—?—in the deciduous belt.
Green Ash.—Common in the deciduous belt.
Red Ash.—Fairly common, except among the cedars.
Blue Ash.—Common, except among the cedars.
Honey Locust.—Uncommon.
Black Walnut.—A few on the east shore.
Red Cedar.—Abundant.
Red Mulberry.—Scattered.
Hop Hornbeam.—Common.
Sycamore.—Fairly common.

Cottonwood.—Bunch on beach east of swamp.
Large-toothed Aspen.—A few on west shore.
Quaking Aspen.—A few on west shore.
Sand Cherry.—Fairly common on west shore.
Choke-cherry.—Fairly common on west shore.
Red Oak.—Abundant in deciduous belt.
Chestnut Oak.—Abundant in deciduous belt.
Basswood.—Common in deciduous belt.
White Elm.—Common in deciduous belt.
Swamp White Oak.—Common north of swamp.
Willow.—Three varieties, mostly on west shore.
Slippery Elm.—A few on end of point.
Sheep-berry.—Scattered through deciduous belt.
Arrowwood.—Fairly common in deciduous belt.
Gooseberry.—Fairly common in deciduous belt.
Hickory.—Fairly common on west beach.
Snowberry.—Fairly common in cedar belt.
Elder.—Fairly common about swamp.
Thorn.—Two varieties, north of swamp.
Sweet-scented Sumach.—Abundant.
Staghorn Sumach.—Abundant south of swamp; common elsewhere.
Poison Ivy.—Common, except in cedar belt.
Raspberry.—Fairly common.
Woodbine.—Scattered.
Wafer Ash.—Abundant on west beach.
Common Juniper.—Common in cedar belt.
Western Prickly Pear.—Common in cedar belt.
Red Bearberry.—Fairly common in cedar belt.
Smooth Honeysuckle.—A few near end of point.
Perfoliate Honeysuckle.—A few near end of point.
Kinnikinnik.—Fairly common on west beach.
Rough-leaved Dogwood.—Common.
Shrubby Bittersweet.—Scattered through deciduous belt.
Buttonbush.—Abundant in swamp.
Swamp Rose.—Common in swamp (?).
Early Wild Rose.—Fairly common (?).

Glossy Rose.—Scattered (?).
Sweetbrier.—Scattered.
Wild Grape.—Abundant.
Greenbrier.—Common in deciduous belt.
Virginia Creeper.
Dodder.
Running Euonyms.
Wild Clematis.
Trumpet Vine.

ONCE UNDER CULTIVATION.

Apple. Peach.

T. N. METCALF.